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Territorial use rights and economic efficiency: the case of the Philippine fishing concessions

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Territorial use rights and economic efficiency: the case of the Philippine fishing concessions

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ABSTRACT

This paper discusses the mechanics and implications of municipal concessions in the Philippines which govern the use of municipal waters for fish corrals, oyster culture beds and gathering of milkfish fry. These concessions or territorial use rights are awarded annually by the resource owner (the municipality) to the highest bidder. In the case of milkfish fry gathering, the concessionaire assumes monopsonist rights of first purchase from fry gatherers. The implications of this system for economic efficiency and equity are discussed theoretically with supporting data from milkfish fry concessions in Antique Province. It is concluded that the system increases economic efficiency in resource use and generates significant income for municipalities which they can then redistribute as they see fit, and therefore not necessarily for the special benefit of fishermen.

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1. INTRODUCTION

As expounded by Gordon (1954) and later by others (Scott, 1955; Christy and Scott, 1965), a characteristic of all open-access capture fisheries is that in the long run effective fishing effort will expand until an open-access equilibrium is reached where total costs equal total revenues. This implies that the "average" fishing unit is just covering its costs and that all resource rents are dissipated. That is to say, industry profits will be zero. 1/ Such a fishery is said to be over-capitalized in that a reduction in effective effort and hence costs could result in positive resource rents which could be used for beneficial purposes in the economy as a whole.

The over-fished nature of many tropical capture fisheries has recently been discussed by Smith (1979), Troadec (1981) and Panayotou (1982), all of whom advocate control over access and use as a potential solution to over-fishing. For example, if the underlying stock-recruitment relationship is of the type described by Schaefer (1954), the same yield that is sustainable at the open-access equilibrium could be obtained at a reduced level of effort and costs (Fig.1). Reductions in effort would increase the economic efficiency of the fishery by increasing the resource rents generated. To a point, and depending upon the exact shape of the yield and total revenue curves, reductions in effort could also actually produce increases in yield and total revenues.

Note that the term "common property" was not used above to characterize capture fisheries. Considerable debate has ensued as a result of Hardin's (1968) assertion that the common-property nature of many renewable resources causes over-use as predicted for the fishery above. Ciriacy-Wantrup and Bishop (1975) took issue with this line of argument and maintained that 'common property' institutions, far from being the 'problem', in fact offered the potential for effectively managing renewable resources such as fisheries. Although not usually stated in quite this way, this same sentiment appears to be behind much of the recent literature that proposes a rediscovery of traditional fisheries management systems (Johannes, 1981; Alexander, n.d.). Because traditional systems for regulating use have broken down in many fisheries as gears have become more mobile and efficient, it has been proposed that community management, control and regulation may offer the best hope of increasing the social benefits to be derived from fisheries (Bailey, 1982; Christy, 1982; Panayotou, 1982).

The solution to over-capitalization as proposed by Gordon (1954) and Scott (1955) was to permit or mandate sole ownership of the fishery in question. A sole owner would attempt to equate the marginal cost of each added unit of effort to the marginal revenue that it would produce. By so doing, the sole owner would apply that level of effective effort which would produce the maximum economic yield (MEY in Fig.1). In most countries it has been thought politically or administratively impossible to implement sole-ownership approaches. Subsequently, in much of the world, attempts to reduce effective effort have focused on various alternative mechanisms including quotas, closed seasons, gear restrictions, taxes or licences that seek to regulate fishermen as a group (Scott, 1979; Crutchfield, 1979; Stokes, 1979). These alternative approaches to rationalization have produced only a few successes despite years of application and refinement in temperate single-species fisheries (Pearse, 1979).

Enforcement of such regulations is always a problem and fishermen ingenuity has in many cases resulted in effective (legal) circumvention of these mechanisms for controlling effort. In tropical, multi-species, multi-gear fisheries, experience with attempts at economic rationalization is even more limited. The fact that most tropical fisheries are small-scale and mobile in nature with dispersed landings also makes enforcement extremely difficult and costly.

Christy (1982) has proposed a search for and documentation of cases of territorial use rights in fisheries (TURFs). He believes that TURFs offer two potential advantages that are particularly important in settings characterized by over-capitalization and poverty in fishing communities. First, TURFs offer the potential of assigning exclusive use rights so that the resource rents that are lost under open-access can be captured. Second, community control over these use rights and the rents that are generated may provide the means by which the welfare of fishing communities can be improved. Similar arguments have also been put forward by Friedman (1981) in support of a territorial approach to rural development.

1/ Profits defined as returns above all costs, including imputed or social opportunity costs.

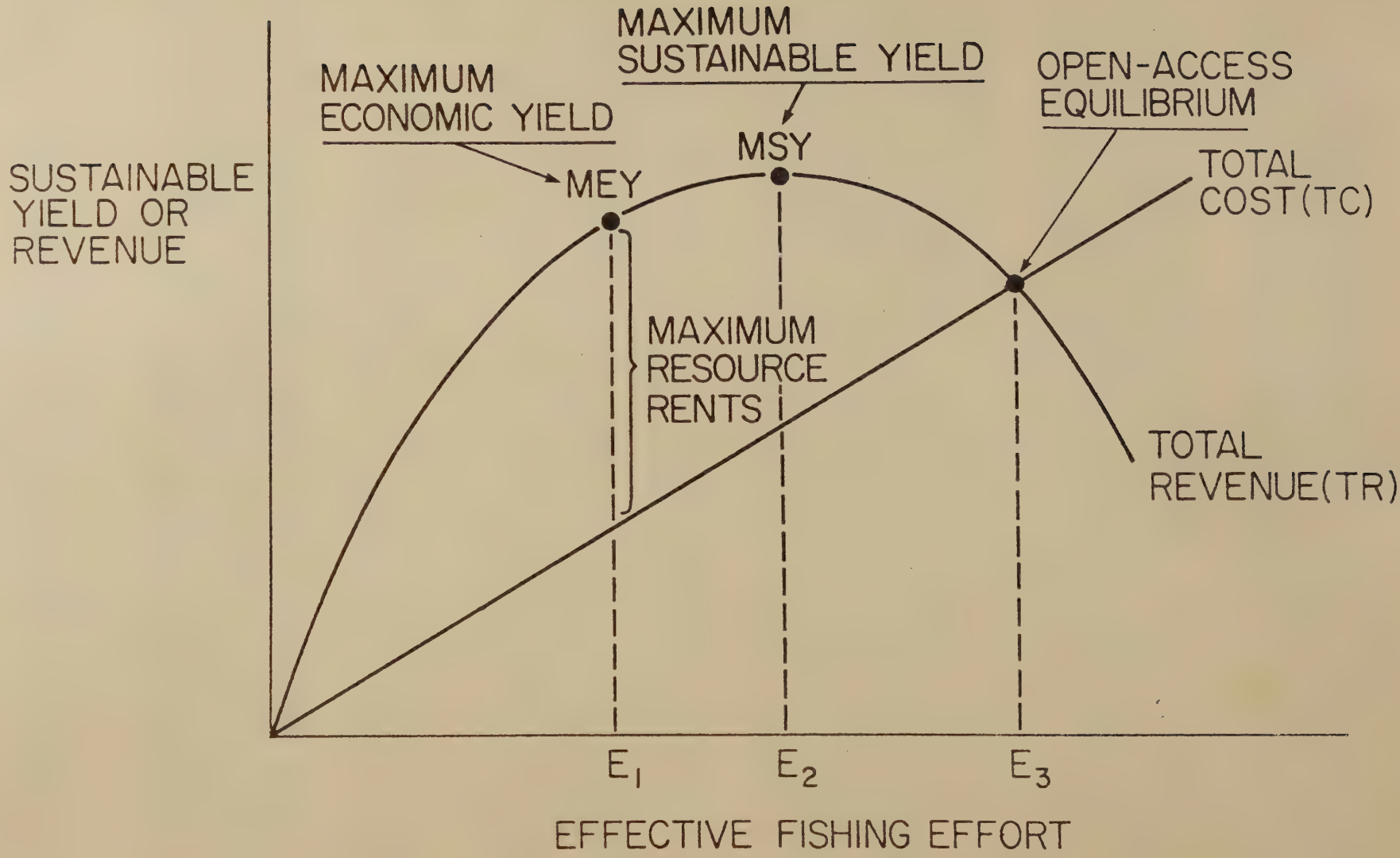

Figure 1 Simple static model of an open-access fishery

There is an inherently political element to the assignment of territorial use rights, especially if the territory in question is narrowed down to the individual community level. This is because decentralization of authority over resource use is thought by many to be politically unfeasible in environments of centralized authority and control as exist in many developing countries. However, something can be learned from precedents for local territorial authority that can be found in many countries. The best known of these systems is undoubtedly that of coastal fishery rights in Japan where fishing communities exercise complete authority over use and thus provide a useful forum for the resolution of conflicts among users (Hiraswa, 1980; Asada, Hirasawa and Nagasaki, 1983).

A similar precedent exists in the Philippines where coastal municipalities are legally empowered to regulate fishing activity within municipal waters to a distance of 3 nautical miles from the coastline (De Sagun and Bautista, 1979; Santos, 1980). All vessels of 3 gross tons or less must be licensed by municipalities, which also have authority to restrict trawling within municipal waters. Because these municipal licences can be secured for only nominal fees (and frequently are not even obtained), they do not effectively limit access to municipal waters.

However, certain types of municipal fisheries - fish corrals (stationary weirs), oyster beds, and milkfish fry gathering - are awarded on a concession basis and these provide extremely interesting examples of TURFs. The purpose of this paper is to examine the last of these (milkfish fry gathering concessions) to see if they satisfy Christy's two goals for TURFs; the capture of resource rents and increased welfare in fishing communities.

In this examination of municipal concessions, we are particularly interested in the potential for increased economic efficiency. We also examine related issues of enforcement and transferability of resource use rights and the potential role for fry gatherers' cooperatives and likely benefits, if any, from such organizations.

2. MUNICIPAL MILKFISH FRY GATHERING CONCESSIONS

Milkfish spawn offshore and the unmetamorphosed larvae seek out fresh water sources along the coastlines of several Indo-Pacific nations, including the Philippines. These fry are caught using hand-operated push and seine nets, then stored temporarily before trans-shipment through a network of dealers to fishpond operators who stock them in brackish-water ponds for rearing to market size (Smith, 1981). In the Philippines, capture of the adult milkfish or "sabalo" is prohibited by law.

Because the fry are caught near the coastline, most often at wading depth, municipalities have authority to regulate the gathering activity. The municipality, as owner of the resource, is empowered through Presidential Decree 704 (The Fisheries Decree of 1975) to "grant to the highest qualified bidder the exclusive privilege of ... gathering 'bangus' fry, or the fry of other species, in municipal waters for a period not exceeding five (5) years" (Sec. 29, PD 704). Similar municipal powers have existed since at least 1932 when they were promulgated in Fisheries Act No. 4003 (Santos, 1980). The bidding process is usually held via sealed bids on a date each year designated by the municipality (usually January-March). The municipality awards the fry concession to the highest qualified bidder, that is to the highest bidder able to pay immediately the necessary downpayment and who is also thought most likely to pay the balance. Municipalities usually require that the balance of the winning bid be paid within one month of the bidding. Concessionaires thus have to complete payment of their concession fee before the annual peak of the fry-gathering season which usually occurs in April-June each year. In cases when the municipality awards the concession for a period longer than one year, the concessionaire makes annual payments.

The concession fee can represent a significant proportion of annual municipal income, especially in rural coastal areas where licences (e.g., for fishing boats), land taxes and building permits generate only limited income. In 35 fry grounds surveyed in 1977 (Smith, 1981), milkfish concession fees represented on average almost 13 percent of municipal income. In the Province of Antique, Western Visayas, 21 percent of the income of the Province's 15 municipalities was derived from milkfish fry concession fees; several municipalities earned almost one-half of their income from this source. Small coastal municipalities use this income primarily to pay the salaries of municipal officials and allowances for representatives of the 'Sangguniang Bayan', or municipal council. The income thus

Table 1

Milkfish fry concession fees (1977-1982) in selected municipalities in Antique Province, Philippines

Municipality	Annual Concession Fees (P) 1/						Average Concession Fee 1977-81 2/	Average Annual Municipal Income 1977-81 2/	Average Concession Fee as % of Municipal Income
	1977	1978	1979	1980	1981	1982	(P)	(P)	
San Jose	100,000	100,000	100,000	210,000 3/	200,000	200,000	142,000	1,067,116	13.3
Hamtik	50,356	93,645	125,336	135,587	136,993	not avail.	108,500	464,500	23.3
Belison	60,000	53,000	53,000	85,000	90,000	95,000	68,200	201,986	33.8
Patnongon	80,000	80,000	80,000	75,000	100,000	110,000	83,000	398,364	20.8
Laua-an	20,000	30,000	36,000	40,000	44,000	37,000	34,000	257,182	13.2

1/ In 1976, P 7.30 = US$1.00
In 1982, P 8.50 = US$1.00

2/ Averages are calculated for 1977-1981 only because data on total municipal income in 1982 are incomplete as the year has not yet ended.

3/ From 1977-1979, the San Jose fry concession was operated by the San Jose Fisherman's Cooperative. The cooperative paid a concession fee set by the municipality which was below that which would have prevailed through public bidding. The cooperative collapsed in 1979, however. Public bidding resumed in 1980 and the concession fee increased significantly as a result.

theoretically benefits the community as a whole rather than special sectors. Concession fees can generate significant income for the resource owner (Table 1). The vast majority of fry grounds in the country are now operated under this municipal concession system.

It was the traditional practice that concessionaires would employ the necessary fry gatherers, paying them a daily wage for their efforts. However, over time the system has changed to one in which concessionaires exercise monopsony rights of first purchase of all fry gathered from "their" fry ground. Gatherers are free to use the fry ground as long as they sell their catch to the concessionaire. Concessionaires thus do not directly control the level of gathering effort. In this sense, concessionaires do not exactly fit the concept of the "sole-owners" of Gordon (1954) and Scott (1955) who are assumed to directly limit fishing effort until marginal costs and marginal revenues are equated.

Still, the Philippine milkfish fry concessionaire needs to create sufficient income to be able to recover his concession fee in addition to his other costs. He does this by controlling the price paid to fry gatherers which in turn indirectly influences the level of gathering effort. Fry gatherers, many of whom have options as part-time fishermen, thus reduce their gathering effort as the price they receive for their fry catch is reduced, other things (e.g., catch rates) being equal. Based on data from Librero et al. (1976), the average household engaged in fry gathering earned only 22 percent of its total annual income from this source.

Unfortunately, reliable data on annual fry catch by fry ground are not available in the Philippines. Concessionaires tend to be very secretive about this information because it is to their advantage in subsequent year's bidding to keep this 'inside' information to themselves. They also express concerns about this information being used for income tax purposes. The Bureau of Fisheries and Aquatic Resources (BFAR) does make estimates of annual fry catch in Antique (Table 2) based primarily upon records of the auxiliary invoices that are required for shipments out of the Province (Antique has very little brackishwater fishpond area, so most fry are shipped elsewhere). However, it has been our personal observation that shippers generally understate the quantities actually shipped, often by as much as 50 percent (Smith, 1981). At best, therefore, one can make a very crude estimate based on the BFAR records of 90-120 million fry caught annually in Antique Province. This probably represents about 8-10 percent of the annual nation-wide fry catch. Table 2 does, nevertheless, indicate the relative year-to-year stability of fry catch in each fry ground.

The lack of production data is unfortunate because, without them, it becomes difficult to test rigorously various hypotheses regarding the concession system and its implications for efficiency and equity. We will proceed, therefore, from this point at some level of abstraction and subsequently in the last section of this paper introduce supporting evidence in the form of cost and price data.

Table 2

Estimated annual fry catch (in millions) from selected milkfish fry grounds in Antique Province, 1977-1982 *

	1977	1978	1979	1980	1981	1982
San Jose	12.7	11.6	10.6	13.8	12.1	15.7
Hamtic	10.0	7.5	7.3	8.5	10.5	12.1
Belison	6.2	5.6	3.9	6.3	5.1	7.7
Patnongon	9.7	10.6	6.9	10.0	10.3	9.7
Laua-an	4.7	3.6	2.6	3.2	2.5	2.4

* Estimated by the BFAR District Office, San Jose, Antique

3. A THEORETICAL MODEL OF THE CONCESSION SYSTEM

Certain key aspects of the concession system are important to our theoretical exposition and these are: (1) the distinction between resource owner (the municipality) and the resource user (the concessionaire); (2) the role of information costs in the bidding process; (3) the role of elasticity of supply in determining the relationship between the concessionaire's selling price and his buying price (from gatherers); and (4) the influence of expected policing costs on the amounts that concessionaires are willing to bid and thus on the resource rents that can be earned by the municipality.

A theoretical model of the milkfish fry concession system was first described in Chong, Smith and Lizarondo (1982). This study examined the system under two alternative assumptions regarding the shape of the sustainable yield (or total revenue) curve. One possibility considered was that it is of the shape depicted in the familiar static economic model of the fishery as in Figure 1. Such a shape implies that biological over-fishing of the milkfish fry is theoretically possible. Since the fry fishery, however, is based upon capture of unmetamorphosed stages of milkfish which, if left in the wild, would have a natural mortality of over 99.99 percent 2/, it is by no means certain that biological over-fishing would occur, no matter how intensive the fry gathering effort. It is far more likely that gathering costs will be such that the open-access equilibrium is reached before the maximum sustainable yield. Therefore, for purposes of the analysis that follows, we shall use a model as depicted in Figure 2, where biological over-fishing is not possible within the relevant range of gathering costs.

In Figure 2, the open-access equilibrium with no concession fee is achieved with a level of fry gathering effort E_1. At this level of effort, the average fry gatherer is earning his opportunity costs (defined as social rather than private opportunity costs) only and no resource rent is generated by the fishery. Increases in resource rents are possible in the fry fishery but only if the effective effort and associated costs are reduced. A sole owner of the resource with complete control over the gathering effort would limit effort to E_2, thus generating the maximum possible resource rents, Max (TR-TC).

The existence of public bidding for the monopsonist rights of the concessionaire will also theoretically produce these maximum resource rents, but only under restrictive assumptions of complete information about expected catch, returns and costs, including policing costs. 3/ In Figure 2, given this 'perfect knowledge', concessionaires will incorporate these expectations into their bid and on average over time the successful bidders will be willing to bid that concession fee (L) which is equivalent to the maximum resource rent. Because the concession fee (L) is a fixed cost, the new total cost curve (TC+L) will be parallel to the original cost curve (TC) and higher throughout by the amount of the fee. In such cases, the resource owner (the municipality) will earn the full resource rent and the resource user (the concessionaire) will earn his opportunity costs, plus possible ability or efficiency rents. The concessionaire will earn none of the resource rents. Furthermore, due to the assumed perfect knowledge among bidders and the existence of a highly competitive product market, the concessionaire will be unable to earn any monopsony profits.

If, as is more plausible, there is less than perfect information available in the bidding process, the municipality will no longer earn exactly the full resource rents. If one of the bidders has expectations (which are later fulfilled) that catch and earnings will be higher than believed possible by other bidders and the municipality, he can be expected to bid sufficiently high to win the bid but less than the hypothetical fee L in Figure 2. On the other hand, if he underestimates the costs of policing his monopsony rights he may have overbid, in which case the municipality will earn more than the full resource rents and the concessionaire will earn less than his opportunity costs. Policing costs are especially important because smuggling of fry by fry gatherers to non-concessionaire buyers is a continual headache for concessionaires.

Smuggling occurs because fry gatherers are attempting to earn some part of the resource rents for themselves. Under the concession system with monopsony rights awarded to a single individual (often financed by large fishpond operators in the Manila area), gatherers can hope to earn on average no more than their social opportunity costs. This would, of course, also be the case under open-access

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2/ This seems reasonable for the high fecundity milkfish, given the estimates for other species that have been made by Hempel (1963) and Dahlberg (1979).

3/ Costs of concessionaires can be divided into direct costs (equipment, etc.), cost of the concession licence, information costs and policing costs.

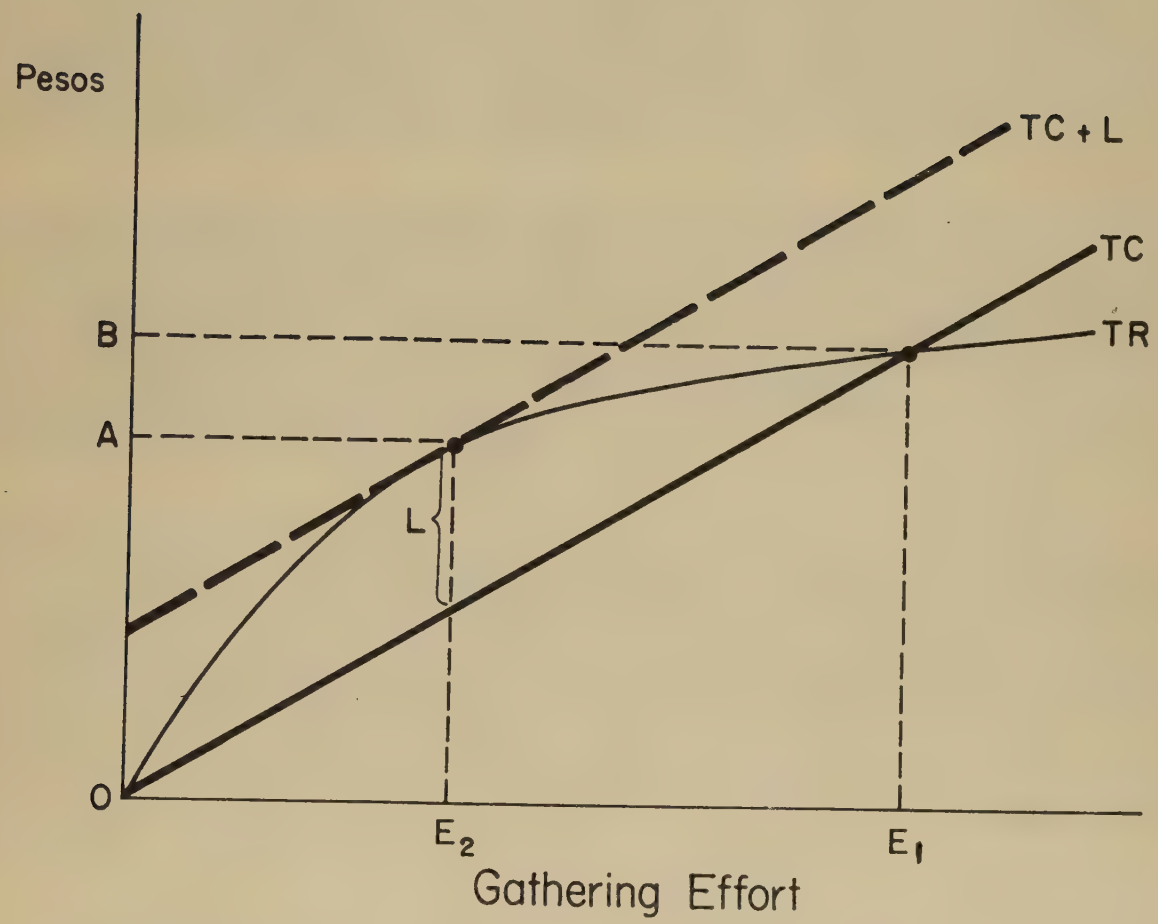

Figure 2 Hypothetical relationship between gathering effort (E), total revenue (TR) and total cost (TC), with and without concession fee

equilibrium, but the average cost of the catch would be higher in the latter case. As stated earlier, the concessionaire has no direct control over the gathering effort; the only way that effort (and average costs) can be reduced is if he reduces the price paid to the fry gatherers. Because some price elasticity of supply can be assumed, the reduced prices will drive those gatherers with better paying opportunities elsewhere out of the industry, and thus reduce the total number of gatherers employed. The departing group would consist of all those whose average gathering cost is higher than the reduced price; those with lower average costs would remain in fry gathering. For those that remain, the strong temptation exists to sell their fry for higher prices to buyers other than the authorized concessionaire.

Smuggling of fry in this manner is more than a theoretical possibility; in fact it is prevalent in most parts of the country, especially Mindanao where enforcement of the concessionaire monopsony rights is difficult and costly due to lack of peace and order (Smith, 1981). At the extreme case where smuggling is totally uncontrollable, the fry fishery will revert back to the open-access equilibrium and the municipality will earn no resource rents because no concessionaires will be willing to bid for the monopsony rights to the fry ground in question. In most fry grounds, the reality is somewhere between no smuggling and total smuggling. Concessionaires expect to incur some policing costs (e.g., armed guards) but are in most cases not willing to incur the high costs that would totally inhibit smuggling. Consequently, in most cases, municipalities will earn somewhat less than the maximum possible resource rent.

One last area of theoretical discussion relates to the relationship between the concessionaire buying price (P_b) and selling price (P_m). In the usual exposition of monopsony behaviour, the practice is to examine supply curves and prices for a single input, such as labour. Henderson and Quandt (1971, p.239-242) for example, examine the case of a monopsonist who uses a single input for the production of a commodity which he then sells in a perfectly competitive market. The typical milkfish fry concessionaire fits this characterization, buying fry as the major input and selling it on the open market in competition with other concessionaires. If the supply curve for the input (fry) is assumed to be positively sloped (i.e., not perfectly inelastic), the price which the concessionaire must pay is an increasing function of the quantity he purchases. Conversely, reductions in purchases can be made by reducing the price paid (or the wage rate if labour is the single input).

The selling price can be assumed to be competitively determined with individual concessionaires having control over it. The determining factor in the relationship between this selling price and the buying price of the concessionaire is the price elasticity of supply. The greater the elasticity, the closer will the buying price be to the selling price; the lower the elasticity the more divergent will be the two prices. 4/ The monopsonist will maximize his profits by purchasing a smaller quantity of fry at a lower price than would prevail under conditions of a perfectly competitive situation. The limit to which the concessionaire can push down the fry price is determined by the price elasticity of supply which in turn reflects the social opportunity costs of fry gatherers. If this opportunity cost approaches zero, the concessionaire could pay a much lower price than would be the case if they had alternative employment options.

4/ Mathematically, we can state the relationship as:

$$P_b = \varepsilon \div (1 + \varepsilon) P_m$$

Where,

P_b = buying price (price received by gatherers)
P_m = selling price (price received by concessionaire)
ε = price elasticity of supply

If $\varepsilon = \infty$, $P_b = P_m$

If $\varepsilon = 0$, $P_b = 0$

If $\varepsilon = 2$, for example:

$$P_b = 2 \div (1+2) P_m$$

that is, the buying price will be 2/3 of the selling price. The authors of this paper are preparing a separate paper that deals in more detail with this relationship and conditions for optimization under varying assumptions of information and policing costs.

4. EMPIRICAL EVIDENCE IN SUPPORT OF THE THEORETICAL MODEL

Although by no means as comprehensive as we would wish, there is some supporting evidence for the theoretical model outlined above. These are costs and returns data for fry gatherers and concessionaires and concessionaire buying and selling prices in Antique Province in 1976 as reported by Smith (1981). We have already shown in Table 1 the resource rents that can be earned by municipalities. The other two groups involved in the concession system are fry gatherers and concessionaires, and this supporting evidence allows us to determine what benefits, if any, these two groups earn from the concession system.

The major cost of fry gathering is labour, shown in Table 3, as the residual after deduction of operating expenses and depreciation from total revenues. The P 5.60 average return per gathering man-day, though relatively low, is an accurate reflection of the low opportunity costs of fry gatherers. The average price received by gatherers covered by Table 3 was P 21.90 per 1,000 fry. It was observed by one of the authors (Smith, 1981) that fry gatherers stopped fry gathering in mid-1977 when average price paid by concessionaires fell below P10.00 per 1,000 pieces, providing an indication that the price elasticity of supply is greater than zero.

The average prices received by gatherers (P_b) and concessionaires (P_m) in Antique Province during the period February 1976 to May 1977 (see Fig. 3), provide an indication of what the price elasticity of supply is in that area. Assuming the relationship between the two prices can be expressed by the relationship $P_b = \varepsilon \div (1+\varepsilon) P_m$, the elasticity can be determined by substituting the average buying price P_b (P20.6) and the average selling price P_m (P 41.1) into the formula. The result is an estimated price elasticity of supply $\varepsilon = 1$. A similar price relationship and elasticity estimate also existed in the Cagayan de Oro area of the Philippines during 1976 (see Fig. 4). Nation-wide in 1976, concessionaires paid P 26.70 per 1,000 fry and received P 52.70 per 1,000 fry, again demonstrating the consistency of this elasticity estimate.

The most convincing evidence that the theoretical model is a reasonable predictor of actual behaviour, and conditions can be found in the costs and returns of concessionaires (Table 4). Although covering a single year (1976), these data provide support for the argument that the concessionaires receive little if any resource rent or monopsony profits. In 1976, of 27 concessionaires for whom complete costs and returns data were collected, 17 incurred a loss while 10 earned a profit. The average net income of P 8,338 shown in Table 4 represents the return to the concessionaire's capital, own and family labour, management and risk. If the opportunity costs of capital and labour are subtracted from this net income, the average concessionaire in 1976 incurred a loss. 5/

Of course, it could be argued that 1976 was an atypically bad year, but there is further evidence in Librero et al. (1976) that concessionaires also did little more than break even in 1974 when national fry catch has been estimated to be slightly higher than in 1976 (Smith, 1981).

The preceding discussion of the milkfish fry concessions in the Philippines demonstrates their potential as a TURF to generate positive resource rents which can be extracted by the coastal municipalities in the form of a concession fee. The system exhibits tendencies towards optimization of resource use, and although these are mitigated somewhat by imperfect information and by problems and costs of enforcement of the concessionaire's monopsony rights, there appear to be clear gains in economic efficiency under the concession system. In many respects, the concession system is not unlike the control of tuna exports by the Maldives Government which, as sole buyer, levies a tax on the product as described by Christy et al. (1981). The mechanism - taxes versus licences - is of course different, but both generate positive resource rents.

5/ Investment cost of P 29,800 and concession fee of P 56,699 both at an opportunity cost of 9 percent per annum plus 109 man-days of own and family labour at P 30 per day, gives a total opportunity cost for these two items of P 11,055 or a loss of P 2,717.

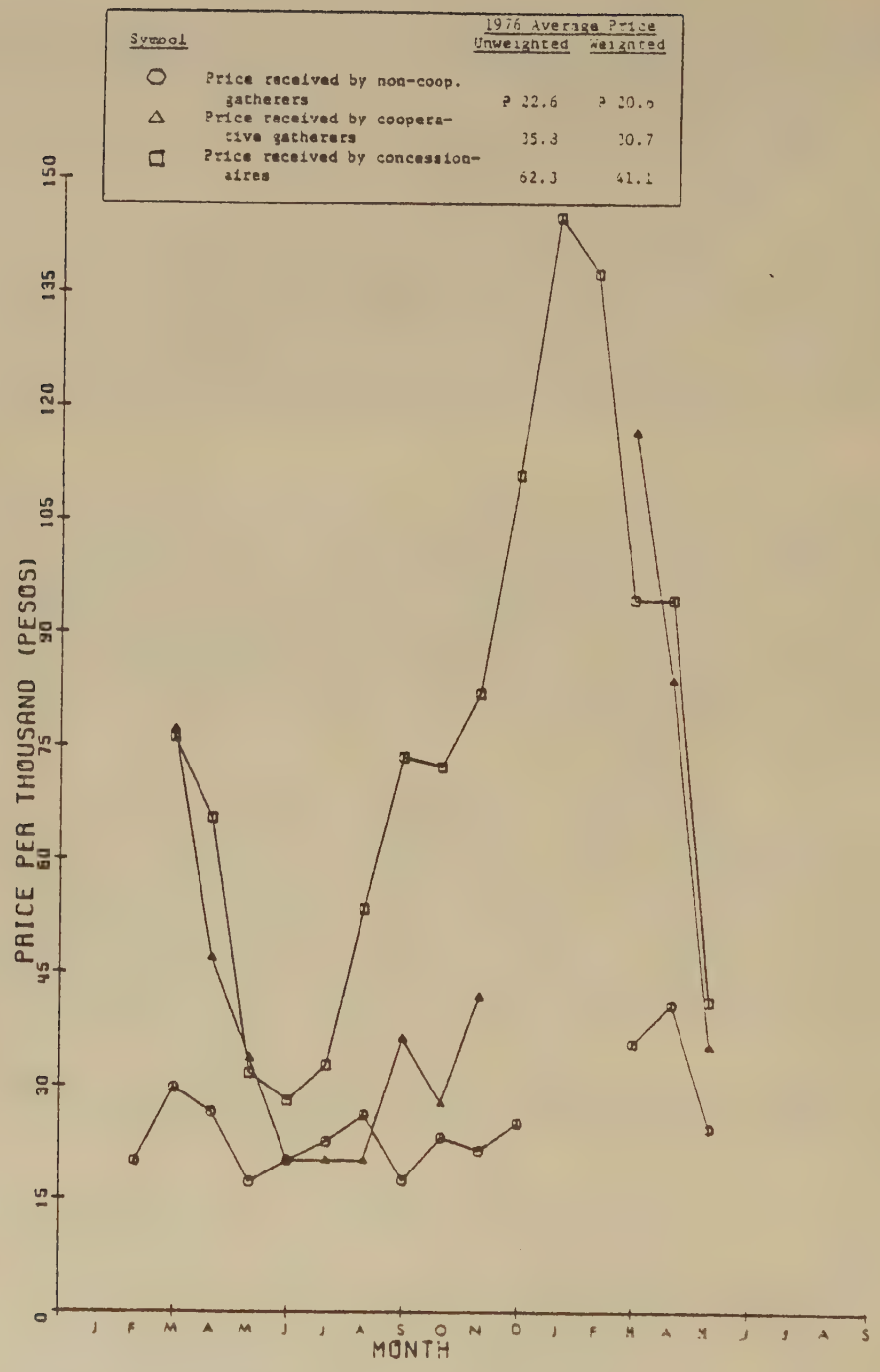

Figure 3 Fry prices: Antique Province, 1976-1977

Source: from Smith (1981) with permission of the publisher

Table 3

Fry gatherer's costs and returns, 1976

	Sub-Total (P)	Total (P)
Revenue from fry sales:		
Milkfish fry (average 38,200 fry per family at average price of P 21.9/000	837.0	
Non-milkfish fry (shrimp)	25.0	
Total Revenue :		862.0
Operating expenses:		
Municipal fees	1.2	
Vehicle fare	6.4	
Repair of gathering gear	5.5	
Miscellaneous (fuel for banca and for lanterns, repair of banca)	16.5 a	
Plastic bags and tying materials	0.5	
	30.1	
Depreciation:		
Gathering gear	50.2	
Banca	12.4 a	
Basins/pails	18.7	
Miscellaneous items (e.g., lanterns)	4.0	
	85.3	
Total Costs :		115.4
Net income (Total Revenue minus Total Costs):		746.6
Average number of man-days family spends gathering		133.6
Average return per man-day b		5.60

a Only 2% of fry gatherers used a banca (dugout) in fry business

b Includes return on gatherer's investment

Source: from Smith (1981a) with permission of the publisher

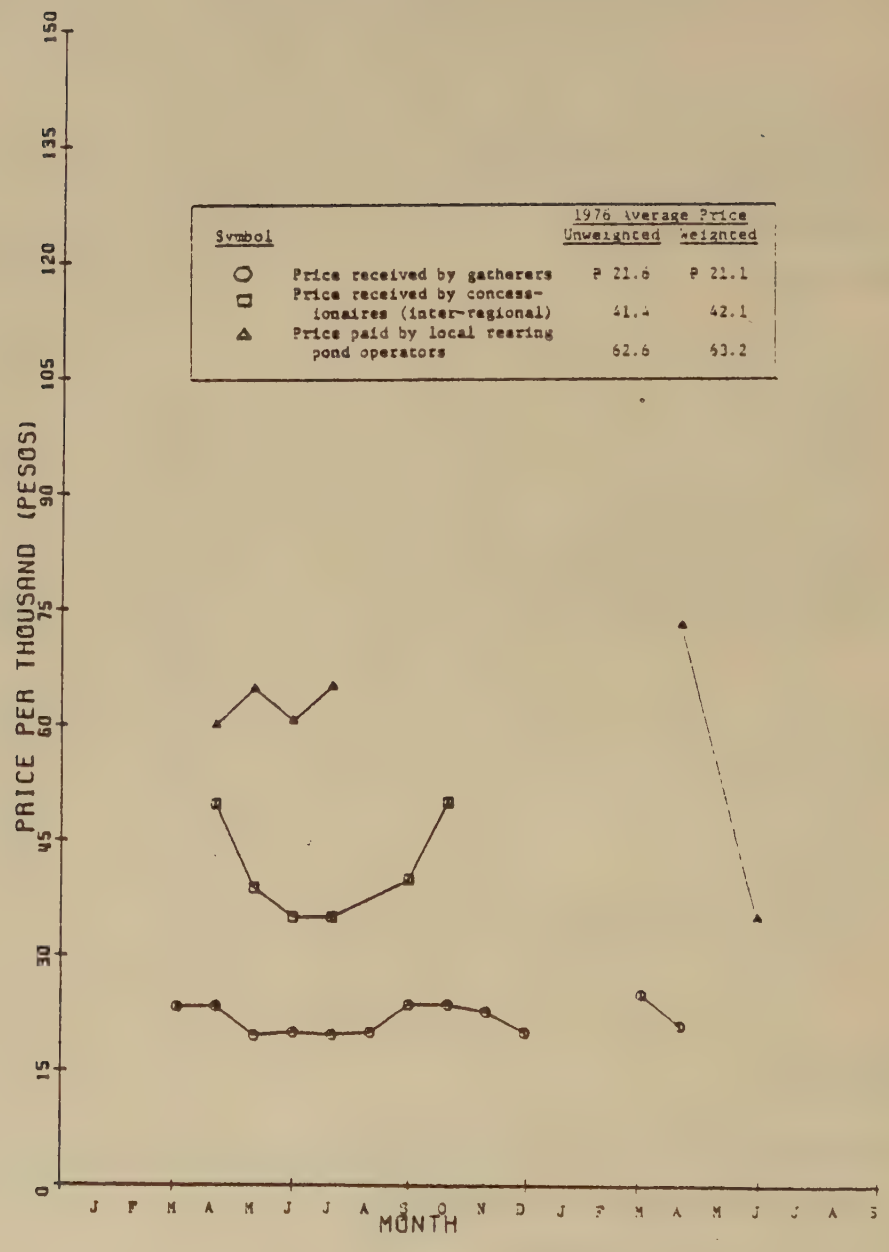

Figure 4 Fry prices: Cagayan de Oro City, 1976-1977

Source: from Smith (1981) with permission of the publisher

Table 4

Concessionaire's costs and returns, 1976

	Sub-Total (P)	Total (P)
REVENUE :		
Milkfish fry sales (average 4,201,000 fry at P 52.73 per thousand) a	221,530	
Shrimp fry sales	3,851	
Value of milkfish fry kept for own use	5,214	
Total Revenue :		230,595
COST OF GOODS SOLD :		
Milkfish fry (4,193,000 at P 26.66 per thousand) a	111,788	
Shrimp fry	2,164	113,952
Net Revenue :		116,643
COSTS :		
Fixed:		
Concession fee	56,184	
Other permits/taxes/licences	76	
Concession public relations	439	
Total Fixed Costs :		56,699
Operating:		
Business travel	2,969	
Feed (eggs)	45	
Oxygen refills	141	
Plastic bags	1,044	
Pandan bags	528	
Tying materials	57	
Vehicle rental	599	
Banca rental	601	
Freight charges	4,229	
BFAR transport permit (auxiliary invoice)	189	
Returns of empty containers	590	
Office/warehouse rental	209	
Communications	217	
Utilities (electricity/water)	36	
Kerosene/gasoline/oil	1,017	
Representation/informal taxes	1,149	
Gifts to gatherers	409	
Repair of equipment	1,796	
Bad debts	7,193	
Miscellaneous (office supplies, food, and equipment rental)	1,425	
Commission labour	15,498	
Casual labour (daily wage)	243	
Wage labour (monthly wage)	3,496	
Interest	2,962	
Total Operating Costs :		46,641

Table 4

(Continued)

	Sub-Total (P)	Total (P)
DEPRECIATION :		
Gathering gear (nets)	1,464	
Boats (bancas)	434	
Miscellaneous gathering gear	242	
Storage containers and equipment	733	
Transport materials	537	
Vehicles	889	
Buildings (warehouses, office)	666	
Total Depreciation :		4,965
Total Costs :		108,305
NET INCOME : (Net Revenue minus Total Costs)		
Represents return to concessionaires' capital, labour (82 man-days), unpaid family labour (27 man-days), management and risk		8,338 **b**
Net Income as percent of sales		3.6%

a It is the accepted practice of sellers (including fry gatherers) to provide extra "free" fry to buyers. It is part of the bargaining process (though often dictated by concessionaires) with fry gatherers usually having to provide up to 20% automatic allowance to concessionaires and with concessionaires in turn providing on average <10% automatic allowance to their buyers. The concessionaire thus pays gatherers for 1,000 pieces of fry but actually receives 1,200 pieces. The purpose of the automatic allowance, or "pasobra" as it is called, is to provide an allowance in advance for the expected mortality that occurs during the next stage in the marketing chain. However, measured average mortality of fry, while in possession of concessionaires, was only 5.8%, considerably less than the up to 20% allowance provided by gatherers. Even after adjusting for the "pasobra" that concessionaires provide to buyers, concessionaires are able to sell a portion of the "free" fry that they acquire from gatherers and hence on average sell larger quantities than they buy.

b Of 27 concessionaire respondents from whom complete cost and return data were collected, 17 lost in 1976 and 10 had positive net incomes.

Source: from Smith (1981) with permission of the publisher.

5. DISCUSSION AND CONCLUSIONS

In the introductory section of this paper, we stated our intention to evaluate this concession system in light of two potential benefits that Christy (1982) believes can be obtained from territorial use rights in fisheries, or TURFs. These are the potential for (1) increasing economic efficiency in resource use in the form of positive resource rents, and (2) improving the welfare of fishing communities.

Answering the second point is somewhat more problematic. While it is true that most communities use the income generated from the concession for salaries of municipal employees who presumably serve the community as a whole, fry gatherers, most of whom are part-time fishermen, are affected in two ways. First, as a group, fry gatherers receive a price for their catch which is lower than that which would have prevailed if no concessionaire existed, but this is offset by a reduction in their average costs because the reduced competition from other fry gatherers contributes to increased average catch per unit of effort. Fry gatherers are a heterogeneous group with different average gathering costs and those with higher opportunity costs will leave fry gathering for alternative employment elsewhere. The reduced levels of employment in fry gathering will be offset by increases in other sectors which absorbed the departing fry gatherers.

A very important point to be made is that this resulting equilibrium in the labour market will have no impact on prevailing low average incomes if there are but few productive employment opportunities in the rural economy in the vicinity of fry grounds (this assumes labour immobility limits employment opportunities to the rural economy). Open-access to the fry ground, however, would also not make anyone better off because all returns to labour that exceed the social opportunity cost of labour would be dissipated with the increased gathering effort by new entrants who would be attracted by the existence of these higher returns. Consequently, open access does not make anyone better off, but does make the municipality worse off. The only way to increase incomes from fry gathering in the long term is through employment generation in other sectors so that the social opportunity cost of labour is raised (see Smith, 1981a; and Panayotou, 1982 for further elaboration of this line of argument). As long as the open-access nature of fry gathering is maintained and resource rents are dissipated, this sector is precluded from raising the social opportunity cost and hence incomes of labour in the rural economy of which fry gathering is a part.

This conclusion leads to the second possible avenue for increasing incomes or benefits of fry gatherers through transfer payments in their favour. Most coastal fishing communities consist of fishing villages and non-fishing villages. To the extent that a municipality's primary sector is thus diversified, part or most of the income generated from a fishing activity by the concession fee can be used to benefit non-fishing households. The extent to which this occurs depends upon the decision of the municipal officials regarding transfer payments and allocation of the municipal budget, which is clearly in part a political decision involving equity considerations. One could argue, of course, that because fry gathering communities may benefit from municipal governance and services made possible by the concession fee, they are better off than when the resource rents were dissipated by open-access conditions. However, the income from the fry concession does not necessarily benefit fishing communities relative to other non-fishing communities, because it depends on the budget allocation decisions of the municipality.

The key issue here is 'who is the owner of the resource'? In the milkfish fry TURF under Philippine law, the municipality is clearly the owner and thus earns the resource rents. The other participants in the system - concessionaires and fry gatherers - tend to earn only their social opportunity costs. Because of the recognition that gatherers do not benefit in any particular way from the concession system, it has been argued that the system should be abolished (Deanon, Ganaden and Llorca, 1974). Because these arguments are based on the unfounded assumption that concessionaires become rich under the system, they overlook the benefits to municipalities, however.

A second proposal occasionally put forward is to form fry gatherer cooperatives and allow them to operate the concession. During the mid to late 1970s, a cooperative did in fact manage the San Jose, Antique fry ground under a reduced concession fee set by the municipality. The higher prices received by fry gatherers who are members of the cooperative can be seen in Figure 3. These higher prices were made possible by the fact that the municipality in question 'shared' its ownership of the resource with the fry gatherers by accepting a concession fee lower than that which probably would have prevailed under public bidding (see Table 1). Unfortunately, this cooperative has now collapsed due to mismanagement problems. More recently, two other Antique fry grounds (Laua-an and Belison) have been awarded to concessionaire cooperatives. Both were awarded after public bidding against private bidders and both have borrowed the funds for their concession fee from the Kilusang Kabuhayan at Kuanlaran (KKK) livelihood programme of the national government.

Unfortunately, the expectations for these cooperatives may be too high. If a cooperative must competitively bid for the concession, there is nothing to predict that it will be any more successful than private concessionaires in increasing the welfare of the fry gatherers, because the resource rent will still accrue to the municipality as owner of the resource. The cooperative may be able to achieve certain cost savings, however, particularly if policing costs are less than those which would be incurred by a private concessionaire seeking to enforce his monopsony rights.

In conclusion, the concession system appears capable of generating increased resource rents, but will only result in increased welfare for fry gatherers if they can share the ownership of the resource with the municipalities. This 'sharing' could take the form of subsidized concession fees for gatherer cooperatives or of a higher proportion of the concession income being spent by the municipalities in fry gathering villages than in non-gathering villages.

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